Selective Removal of Oxygen From Syngas

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of Application Serial No. 60/353,822 filed on January 31, 2002, entitled Oxygen Selective Membrane To Remove Oxygen From Syngas, 60/353,774 filed on March 12, 2002, entitled Oxygen Selective Membrane To Remove Oxygen From Syngas and Application Serial No. 10/219,108 filed on August 15, 2002, entitled Selective Removal of Oxygen From Syngas. now PAT 6,747,066

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not applicable.

FIELD OF THE INVENTION

[0001] The present invention generally relates to the preparation of liquid hydrocarbons from natural gas/methane, oxygen and/or steam. In particular, the present invention relates to improved methods for preparing liquid hydrocarbons from improved feedstock streams.

BACKGROUND OF THE INVENTION

[0002] Large quantities of methane, the main component of natural gas, are available in many areas of the world, and natural gas is predicted to outlast oil reserves by a significant margin. However, most natural gas is situated in areas that are geographically remote from population and industrial centers. The costs of compression, transportation, and storage make its use economically unattractive.

[0003] To improve the economics of natural gas use, much research has focused on methane as a starting material for the production of higher hydrocarbons and hydrocarbon liquids. The conversion of methane to hydrocarbons is typically carried out in two steps. In the first step, methane is reformed with water to produce carbon monoxide and hydrogen (*i.e.*, synthesis gas or syngas). In a second step, the syngas intermediate is converted to higher hydrocarbon products by processes such as the Fischer-Tropsch Synthesis. For example, fuels with boiling parts in the middle distillate range, such as kerosene and diesel fuel, and hydrocarbon waxes may be produced from the synthesis gas.

[0004] Current industrial use of methane as a chemical feedstock proceeds by the initial